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Staghorn coral (Genus-*Acropora*) of Elphinstone Island in Myeik archipelago, southern Taninthayi coast of Myanmar

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Abstract

This study was carried out from Elphinstone Island and adjacent Islands: Taung Pan Gyi, Taung Pan Nge, Maw Shin, Sha Aw and The Hnit Tan of Tanintharyi Coastal Region. All collected coral specimens were recorded which composed by 41 species of *Acropora* during the present study period. The highest number of coral species (20) was found in Taung Pan Gyi and Mon Shin Stations. The lowest number of coral species (12) was found in Sha Aw Station (Table 2). The environmental parameter such as temperature, salinity and transparency ranged from 27-29 °C, 30-36‰ and 4.8-5.6m respectively. The temperature and transparency ranges were slightly differed but the salinity range differed considerably. *Acropora formosa*, *A. valida*, *A. nasuta* and *A. horrida* were found to be common in the present study areas.

Keywords: *Acropora*, elphinstone island, myeik archipelago, composition, distribution

Introduction

Tanintharyi Region which situated in the Myanmar's southern zone possesses an Archipelago of more than 800 islands. Fringing coral reefs are abundant around the uninhabited islands of Myeik (Mergui) Archipelago, especially around those isolated islands lying offshore. These coral reefs harbor many diverse marine species and abundant fishery resources. Because of a very beautiful natural scenery, the reef area can be developed for eco-tourism. Elphinstone Island is one of the largest outer islands of Myeik Archipelago waters. Around this island, there are two populated fishing villages and one large pearl culture farm. The stations are at faraway villages except Sha Aw. The Sha Aw is developed with seaweed (*Kappaphycus alvarezii*) farms. The reefs in and near these islands seem to support rich island biotic communities; the existence of various fisheries near by the island also indicated the importance of reef's presence and their health.

The family Acroporidae consists of many types of corals which possess a branching bush-like form of growth. The acroporidae is the most diverse and prevalent family while some species are still unidentified. They provide an ideal refuge for a complete fauna of invertebrates and small fishes, particularly *Chormis* and *Dascyllus*. No matter where on the reef the *Acropora* colonies are situated they always try to expose the maximum of their surface area to the light. Thus the colony is spreading out horizontally although it is attached to a vertical face of the reef. Also the fineness of the branches and whether they are soldered together at their bases depends on the turbulence of the water. The degree of polymorphism within the family Acroporidae is remarkable. The objectives of the current study are 1) to identify the diversified species of staghorn corals.

Materials and Methods

The present study selected the Staghorn Coral; the hard corals which inhabited the Myeik Archipelago water to observe. The living coral samples were collected from five selected stations at Elphinstone Island; (1) Taung Pan Gyi (Lat. 12° 25'N and Long. 98° 09'E), (2) Taung Pan Nge (Lat. 12° 23'N and Long. 98° 08'E), (3) Mon Shin (Lat. 12° 24'N and Long. 98° 06'E), (4) Sha Aw (Lat. 12° 15'N and Long. 90° 05'E) and (5) The Hnit Tan (Lat. 12° 17'N and Long. 97° 57'E).

The living coral samples were collected once in two months during the spring tide. The coral

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samples were mainly collected by snorkeling in shallow water and with the help of local divers who were supplied with air-compressor in deeper water. Besides diving the samples were also collected by hand in the intertidal zone during low tide. During the samples collection period, the seawater from each station was measured the salinity by using refractometer, seawater temperature by the thermometer and the transparency by schi-disc. Then living coral samples were photographed including measurements, and the color of corallum and the branch tips records were also recorded with the digital camera (Fujifilm FinePix S 2000 HD). The detail external morphological characters of all collected specimens were identified under the binocular microscope and followed the methods of Veron and Wallace [1], Wallace [2] and Veron [3].

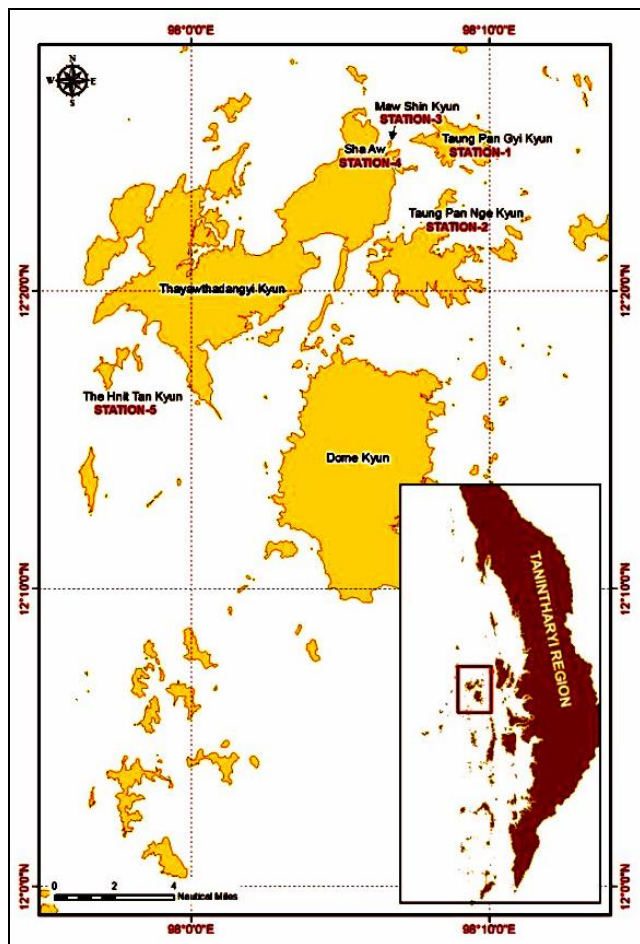


Fig 1: Showing the sampling areas of the Elphinstone Island, Tanintharyi Coastal Region

Results and Discussion

The present study was conducted at five stations of Myeik Coastal Waters (Elphinstone Island and its adjacent islands). Forty-one coral species of *Acropora* under Family Acroporidae were recorded in the present study area. The characters of corals were diverse. Species were identified and classified by morphological characters of corals. The number of coral species observed from five stations ranged from 12 to 20 species (Table 1). The occurrence of corals species differed from one station to each other. Some species were found to be common at all stations but some were restricted. *A. florida*, *A. pulchra*, *A. caroliniana*, *A. microphthalma*, *A. grandis*, *A. kirstyae*, *A. hemprichii*, *A. eurystoma*, *A. divaricata*, *A. arabensis*, *A. intermedia*, *A. donei* and *A. loripes* were recorded to be very rare throughout the study

period. The species *Acropora florida*, *A. pulchra*, *A. caroliniana*, *A. microphthalma* and *A. grandis* were observed only at Taung Pan Gyi Station. *A. kirstyae* and *A. hemprichii* at Taung Pan Nge Station, *A. eurystoma* and *A. divaricata* at Maw Shin Station, *A. arabensis*, *A. intermedia*, *A. donei* and *A. loripes* at Sha Aw Station were found during the present study period.

Acropora formosa, *A. valida*, *A. nasuta* and *A. horrida* were recorded to be common in the present study area. But *A. formosa* and *A. valida* were not observed at Sha Aw Station and *A. nasuta* and *A. horrida* were not found at Taung Pan Gyi Station. *A. variolosa*, *A. secale*, *A. aspera*, *A. humilis*, *A. cervicornis*, *A. samoensis*, *A. digitifera*, *A. hoeksemai*, *A. bushyensis*, *A. yongei*, *A. chesterfieldensis*, *A. proximalis*, *A. elegans*, *A. downingi*, *A. monticulosa*, *A. pharaonis*, *A. spicifera* and *A. roseni* were found to be restricted at each station during the study period.

The species ranges differed from station to station. In Taung Pan Gyi Station, the species were found to be most common. In this station, the water transparency is 5.6m and the water current is steady during the field study (Figure 4). In Sha Aw Station, the species were recorded to be very rare. The water transparency was the least (4.8m) comparing with all stations and the water current is stronger than other stations (Taung Pan Gyi, Taung Pan Nge and Maw Shin). In addition, the bed of coral reef was covered with sand because Sha Aw is the sandy beach. And the reef was destroyed by wave action. The light cannot penetrate in to the deep water because of detritus. In Sha Aw, War War Soe (2008) described 26 species of Acroporidae from surrounding the Thayawthadangyi Kyun in the North of Myeik Archipelago. So compared with the previous study, the species composition was more than the present study. In the previous study, a large variety of coral species were found to be common but coral species of *Acropora* were depleted during the present study period.

In Maw Shin Station, the species were observed to be more common than Taung Pan Nge, Sha Aw and The Hnit Tan. In Taung Pan Nge Station, the species were found to be rare. This station located opposite side to Taung Pan Gyi. So, the environment conditions are insignificantly differed. But the species composition differed. In The Hnit Tan Station, the species were also recorded to be rare. Although the species composition was high, the specimens were collected were rare because environmental condition especially water current was strong.

A comparison of the environmental parameters such as temperature, salinity and transparency were observed difference at each station throughout the field study. In Taung Pan Gyi Station, the highest temperature and salinity were 28°C and 35‰, lowest were 27°C and 30‰ and transparency was 5.6m. In Taung Pan Nge Station, the highest were 28°C and 34‰ and the lowest were 27°C and 30‰ and transparency was 5.4m. In Maw Shin Station, the highest were 28°C and 36‰ and the lowest were 27°C and 30‰ and transparency was 5m. In Sha Aw Station, the highest were 28°C and 36‰ and the lowest were 27.5°C and 30‰ and transparency was 4.8m. In The Hnit Tan Station, the highest were 29°C and 34‰ and the lowest were 28°C and 31‰ and transparency was 5.6m. According to above mentioned stations, the temperature, salinity and transparency ranged from 27-29 °C, 30-36‰ and 4.8-5.6m respectively. The temperature and transparency ranges were insignificantly different but the salinity range differed considerably (Figure 3 and 4). According to field study, the temperature and salinity

were highest in February at almost all stations (Figure 3). The transparency was highest at Taung Pan Gyi Station and The

Hnit Tan Station (Figure 4).

Table 1: The distribution and composition of corals species of the Genus *Acropora* during the present study.

Family	Genus	Sr. No.	Species Name	St. 1	St. 2	St.3	St.4	St. 5
Acroporidae	<i>Acropora</i>	1	<i>A. variolosa</i> Klunzinger, 1879	-	+	-	+	-
		2	<i>A. hemprichii</i> Ehrenberg, 1834	-	+	-	-	-
		3	<i>A. cerealis</i> Dana, 1846	+	-	+	-	+
		4	<i>A. arabensis</i> Hodgson and Carpenta, 1995	-	-	-	+	-
		5	<i>A. secale</i> Studer, 1878	+	-	+	-	-
		6	<i>A. kirstyae</i> Veron and Wallace, 1984	-	+	-	-	-
		7	<i>A. aspera</i> Dana, 1846	+	-	-	+	-
		8	<i>A. florida</i> Dana, 1846	+	-	-	-	-
		9	<i>A. humilis</i> Dana, 1846	+	-	-	-	+
		10	<i>A. cervicornis</i> Lamarck, 1816	-	+	-	+	-
		11	<i>A. pulchra</i> Brook, 1891	+	-	-	-	-
		12	<i>A. selago</i> Studer, 1878	-	+	+	+	-
		13	<i>A. samoensis</i> Brook, 1891	+	+	-	-	-
		14	<i>A. digitifera</i> Dana, 1846	-	-	+	-	+
		15	<i>A. hoeksemai</i> Wallace, 1997	+	+	-	-	-
		16	<i>A. bushyensis</i> Veron and Wallace, 1984	+	-	-	+	-
		17	<i>A. glauca</i> Brook, 1893	+	+	-	-	+
		18	<i>A. eurystoma</i> Klunzinger, 1897	-	-	+	-	-
		19	<i>A. intermedia</i> Brook, 1891	-	-	-	+	-
		20	<i>A. caroliniana</i> Nemenzo, 1976	+	-	-	-	-
		21	<i>A. yongei</i> Veron and Wallace, 1984	-	-	+	+	-
		22	<i>A. donei</i> Veron and Wallace, 1984	-	-	-	+	-
		23	<i>A. roseni</i> Wallace, 1999	+	+	-	-	-
		24	<i>A. millepora</i> Ehrenberge, 1834	-	+	+	-	+
		25	<i>A. microphthalma</i> Verrill, 1869	+	-	-	-	-
		26	<i>A. chesterfieldensis</i> Veron and Wallace, 1984	+	-	+	-	-
		27	<i>A. loripes</i> Brook, 1892	-	-	-	+	-
		28	<i>A. grandis</i> Brook, 1892	+	-	-	-	-
		29	<i>A. formosa</i> Dana, 1846	+	+	+	-	+
		30	<i>A. proximalis</i> Veron, 2000	+	+	-	-	-
		31	<i>A. muricata</i> Linnaeus, 1758	-	-	+	-	-
		32	<i>A. granulosa</i> Edwards and Haime, 1860	-	+	+	-	+
		33	<i>A. elegans</i> Edwards and Haime, 1860	+	-	+	-	-
		34	<i>A. valida</i> Dana, 1846	+	+	+	-	+
		35	<i>A. downingi</i> Wallace, 1999	-	-	+	-	+
		36	<i>A. nasuta</i> Dana, 1846	-	+	+	+	+
		37	<i>A. horrida</i> Dana, 1846	-	+	+	+	+
		38	<i>A. monticulosa</i> Bruggemann, 1879	+	-	+	-	-
		39	<i>A. pharaonis</i> Edwards and Haime, 1860	-	-	+	-	+
		40	<i>A. spicifera</i> Dana, 1846	-	-	+	-	+
		41	<i>A. divaricata</i> Dana, 1846	-	-	+	-	-
Total				20	16	20	12	13

Symbols; +=present, -=absent

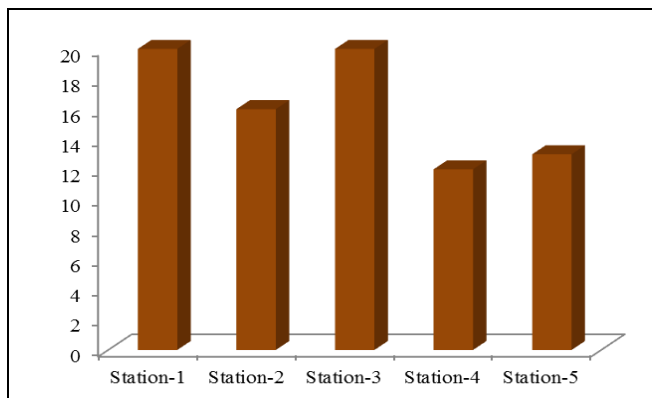


Fig 2: Distribution and composition of *Acropora* corals species during the present study.

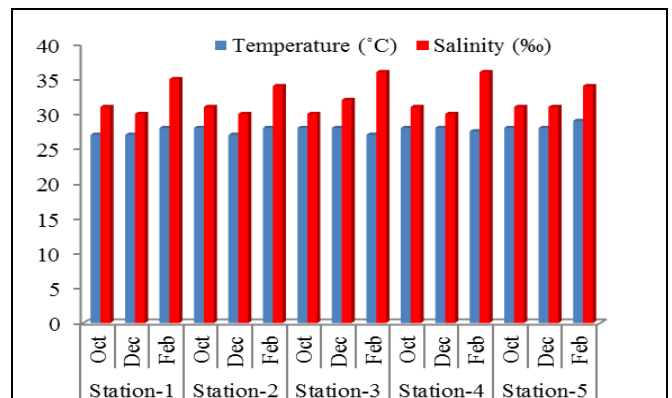


Fig 3: Measurement of temperature and salinity during the present study.

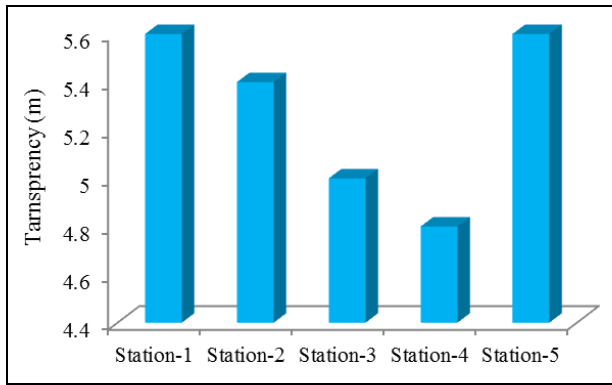


Fig 4: Measurement of transparency during the present study.

The species exhibited a great variety of forms. The common species, *Acropora nasuta* and *Acropora horrida* were identified by mean of different colonies forms. The colony of *Acropora nasuta* is a small corymbose table while that of *Acropora horrida* has branches which are compact bushy. Similarly, the very rare species *Acropora florida* and *Acropora kiristya* were classified according to axial corallites. The axial corallites of *Acropora florida* has similar radial corallites but that of *Acropora kiristya* has different to radial corallites.

War War Soe^[4] and War War Soe and Htay Aung^[5] observed 26 species of Acroporidae, 22 species of *Acropora*, 3 species of *Montipora* and 1 species of *Astreopora* from Thayawthadangi Kyun where temperature range was 27.5-30.5 °C and salinity range was 30-34%. In the present study, 41 species of *Acropora* were recorded. The temperature range was 27-29 °C and salinity range was 30-36‰. The environmental parameter was insignificantly different but the species composition significantly differed between the present study and the previous study.

In Myanmar, 14 species of Acroporidae, 10 species of *Acropora*, 3 species of *Montipora* and 1 species of *Astreopora* were described for Myanmar Coastal Regions especially Rakhine, Ayeyarwaddy and Tanintharyi Coastal Region^[6]. *Acropora pharaonis*, *A. digitifera* and *A. aspera* were only observed in the present study. *Acropora valida* were not observed in previous study^[6] but was found in the present study. This species was also described in the International symposium on corals and coral reefs, 1972 (as cited in^[6]).

In the Myeik Archipelago Coastal Zone, Cherry Aung^[7] described 149 species belonging to 4 genera under Family Acroporidae (45 species of *Montipora*, 100 species of *Acropora*, 3 species of *Astreopora* and 1 species of *Anacropora*) recorded from 24 islands of Myeik Archipelago Waters. But *Astreopora* and *Anacropora* were not recorded in the present study. The four species recorded by Cherry Aung^[7] were; *Asteropora macrostoma*, *Asteropora myriophthalma*, *Asteropora listeri* and *Anacropora forbesi* which were not found in the present study. In the previous study, Acroporidae was found at all stations except Maing Island and Kadan Island. So, Acroporidae was the most diverse group and dominated along the Myeik Archipelago. In the present study, Taung Pan Nge, *Acropora* was the low diverse and dominated all other coral species during the field study.

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